

NOTES ON MIDDLE AMERICAN BIGNONIACEAE

ALWYN H. GENTRY¹

Recent collections of Bignoniaceae include three new species of *Amphitecna* from Guatemala and Chiapas. In addition the two new combinations needed for the checklist of Belize plants being published in this journal (Spellman, Dwyer & Davidse, 1975; Dwyer & Spellman, in preparation) are proposed. One of these derives from a proposed generic merger — *Neomacfadya* with *Arrabidaea*. Several Belize taxa should be known by names other than those used in the *Flora of Guatemala* (Standley & L. Williams, 1974); these changes are briefly noted below with the names used in the *Flora* in parentheses. For complete synonymies see the cited reference or my *Flora of Panama* treatment (Gentry, 1973b).

NEW SPECIES OF AMPHITECNA

Most genera of Bignoniaceae have wind-dispersed seeds and wide-ranging species which often extend from Mexico to Argentina. Local endemics are exceedingly rare in such genera with the second collection of new species described, for example, from Amazonian Brazil as likely to turn up in Venezuela or Peru as Brazil (Gentry, 1974; Sandwith, 1939). Thus all but seven of the 57 wind (or water) dispersed species of Bignoniaceae native to northern Central America reach northern South America. In dramatic contrast the indehiscent-fruited species of *Amphitecna* and *Parmen-tiera* with mammal-dispersed seeds have very localized distributions. None of the 13 primarily mammal-dispersed species of Bignoniaceae native to northern Central America is known to occur outside the region. Similarly none of the eight mammal-dispersed species of Panama and Costa Rica occurs elsewhere as compared to the 78% of wind or water dispersed species which reach northern Central America and the 88% which reach Venezuela (Gentry, 1974). Several species of *Crescentieae* are apparently endemic to single mountains or even specific rock outcrops (Gentry, 1974, 1976c). In light of these generalizations, the discovery of several new species of *Amphitecna* in northern Central America may be seen in perspective as a reflection of predictable evolutionary tendencies rather than an exercise in taxonomic splitting.

¹Research supported in part by National Science Foundation grant GB-40103.

Amphitecna costata A. Gentry, sp. nov.

Figure 1A

Arbor parva. Folia alterna, obovata vel obovato-elliptica, acuminata, venulis albo-marginatis. Inflorescentia uniflora, flore in brachyblasto bracteato in trunco; calyx bilabiatus; corolla pallide viridis, campanulata, lobis connatis; stamina subexserta; ovarium oblongum, longitudinaliter striatum. Fructus indehiscens, cylindricus, longitudinaliter costatus.

Small tree 3–14 m. tall; branchlets angulate, the surface smooth, tannish. Leaves simple, alternate, usually clustered near tips of twigs, obovate to obovate-elliptic, sharply acuminate (the acumen 1–3 cm. long), cuneate at base, 21–50 cm. long, 6.5–18 cm. wide, coriaceous, glabrous throughout, midrib raised slightly above and conspicuously below, secondary veins 10–16 on a side, plane above, prominulous below, tertiary venation perfectly plane and conspicuously whitish-margined below (cf. *A. silvicola* L. Wms.), drying gray or olive gray with the main veins darker below, petiole poorly differentiated, occasionally to 1 cm. long but winged at top and merging with leaf base. Flowers cauliflorous, mostly near base of trunk, mostly borne singly at the nodes from fascicles of small bracts, the pedicels 2–2.5 cm. long, the calyx bilabiate, 1.3–1.5 cm. long, the lobes obtuse to subapiculate, glabrous; corolla pale green with the lobes pale lilac-pinkish, tubular-campanulate, ca. 3.5 cm. long, the lobes completely fused; stamens subexserted, the anther thecae divergent, 4–5 mm. long; pistil ca. 3.5 cm. long, the ovary oblong, 3–4 mm. long, prominently longitudinally striate; disc annular-pulvinate, ca. 6 mm. wide. Fruit cylindrical, tapered to both ends, prominently longitudinally costate, 22–36 cm. long, 6–7 cm. wide, the seeds embedded in the whitish pulp.

TYPE: **Guatemala.** IZABAL: Rio Juyama, southeast of Cheyenne, 15 miles southwest of Bananera, 50–100 m., 8 Apr 1940, *Steyermark* 39130 (Holotype, F 1042987; isotypes, F 1042929, 1055459).

Endemic to low altitudes in Izabal Department, Guatemala.

ADDITIONAL COLLECTION EXAMINED: **Guatemala.** IZABAL: along Rio Tameja, alt. 50 m., shrub 10–15 ft. tall, *Steyermark* 41796 (F, US).

This species was confounded with *Amphitecna macrophylla* (Seem.) Miers ex Baill. in the *Flora of Guatemala* and the fruit and flowering branch (but not the leaf nor corolla) illustrated for that species are actually *A. costata*. The very different leaves of

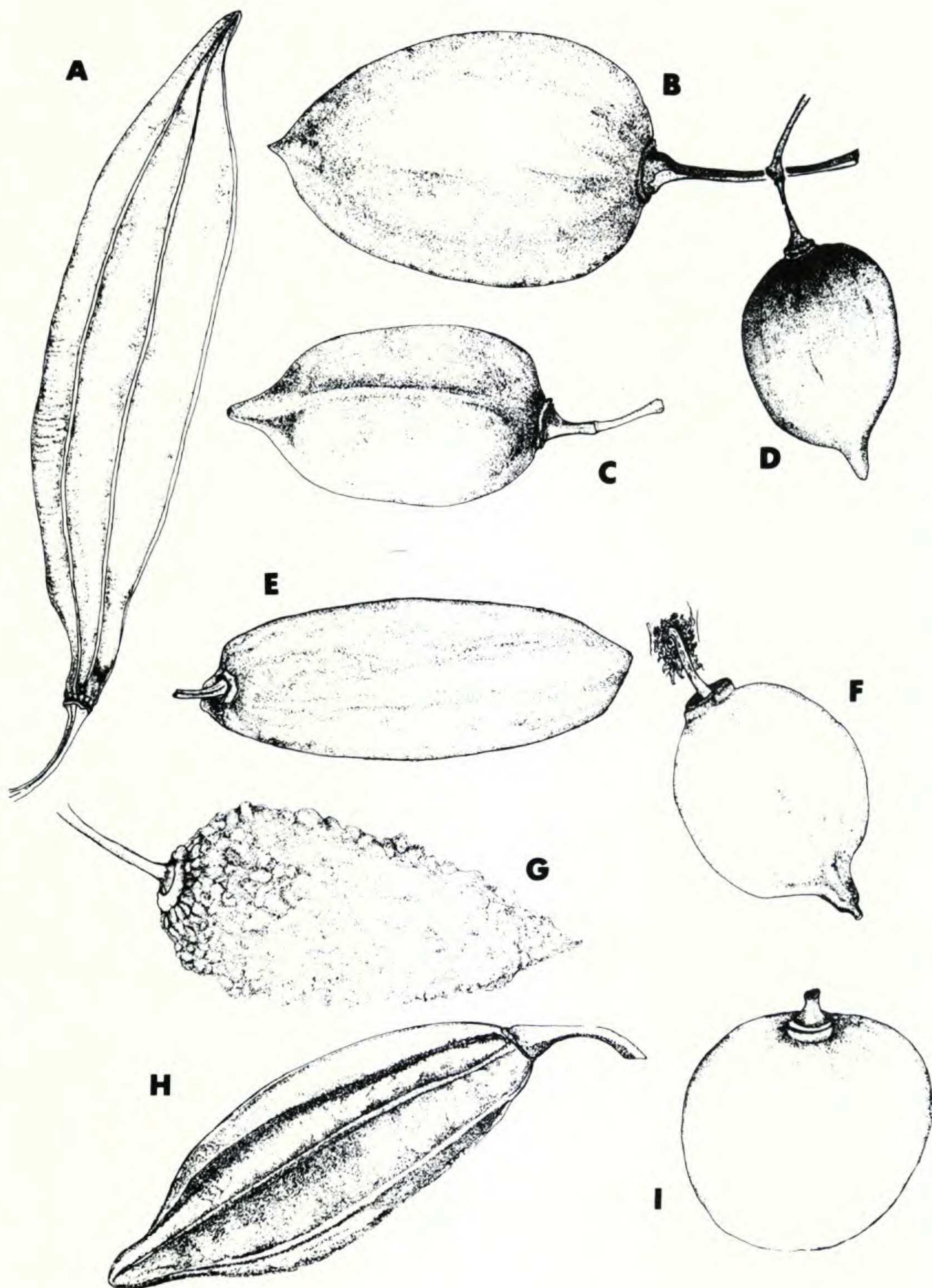
A. macrophylla are much larger ((40–)50–100 cm. long, to 35 cm. wide) and oblanceolate while its fruit (Figure 1H) is shorter and angulate rather than long, cylindrical, and costate as in *A. costata*. These two species are ecologically and altitudinally separated. *Amphitecna macrophylla* occurs farther west in Guatemala in Alta Verapaz and Huehuetenango Departments and only at higher altitudes between 300 and 1500 m. It is reported to be locally very common on limestone, especially around 1000 m. I have also seen sterile collections of *A. macrophylla* from the states of Oaxaca and Veracruz in Mexico.

***Amphitecna breedlovei* A. Gentry, sp. nov.** Figure 1C, D.

Arbor parva. Folia alterna, obovata vel oblanceolata, coriacea, sessilia, infra venis secundariis prominentibus. Inflorescentia uniflora, flore terminali; calyx profunde bilabiatus; corolla albida, campanulata, lobis connatis; ovarium ovoideum. Fructus indehiscens, oblongo-ellipsoideus, apiculatus, laevis.

Small tree 7–8 m. tall; branchlets conspicuously angulate when young, subterete when older. Leaves simple, alternate, obovate to oblanceolate, acute to rounded at apex (often more or less apiculate), more or less cuneate at base, 5–18 cm. long, 1.7–6 cm. wide, coriaceous, glabrous throughout except for scattered lepidote scales, midrib noticeably raised above and especially below, secondary veins 8–14 on a side, prominent below, plane and hardly visible above, the main veins below drying tannish against an olive-gray surface, petiole essentially absent. Flowers (description includes *Breedlove 32819*, see below) terminal, borne singly, the calyx 1.5–2 cm. long, bilabiate split to near base, pedicel 2.5–4.5 cm. long; corolla white, campanulate, 3–4 cm. long, 1.5–1.8 cm. wide at mouth of tube, the lobes completely fused; ovary 2 mm. long, 2 mm. wide, disc 2 mm. long, 7 mm. wide. Fruit a pepo or calabash,

Figure 1. Fruits of some Middle American species of *Amphitecna*, all $\times 1/3$. A, *A. costata* A. Gentry (after *Steyermark 39130*); B, *A. montana* L. Wms. (after *Breedlove 22260*); C, *A. breedlovei* A. Gentry (after *Breedlove 24946*); D, *A. breedlovei* A. Gentry (after *Breedlove 38684*); E, *A. silvicola* L. Wms. (after *Breedlove 38800*); F, *A. apiculata* A. Gentry (after *Breedlove 33928*); G, *A. cf. steyermarkii* (A. Gentry) A. Gentry (after *Breedlove & McClintock 34091*); H, *A. macrophylla* (Seem.) Miers ex Baill. (after Griggs, 1904); I, *A. latifolia* (Mill.) A. Gentry (after *Liesner 1384*).



oblong-ellipsoid, apiculate, smooth-surfaced, 10 cm. long (including the 1.5 cm. long apiculation), about 5 cm. in diameter.

TYPE: **Mexico.** CHIAPAS: Municipio Villa Corzo, 10–12 km. SW of Colonia Agronomos Mexicanos along a logging road to the ridges of Cerro Tres Picos, slopes with *Pinus* and *Quercus* along a stream with *Ficus* spp., 1000 m. alt., 4 May 1972, *Breedlove 24946* (Holotype, CAS).

Slopes of Rio Grijalva Valley in western Chiapas from 850–1000 m. in the Municipios of Villa Corzo and Ocozocoautla, montane rain forest and evergreen seasonal forest habitats (sensu Breedlove, 1973).

ADDITIONAL COLLECTIONS EXAMINED: CHIAPAS: Municipio Villa Corzo, 65 km. S of Mexican Highway 190 on road from Tuxtla Gutierrez to Nuevo Concordia, steep canyon with seasonal evergreen forest and slopes of *Quercus*, 850 m. alt., *Breedlove 37732* (CAS). Municipio Ocozocoautla, Rancho Concepcion y Cerro Brujo, *Miranda 5154* (US).

A similar plant but with leaves tapering to a long narrow tip and a shorter fruit (Figure 1D) which is almost globose except for the acumen occurs at lower altitudes between 550 and 700 m., also on the slopes bordering the Rio Grijalva. This is presumably a variant of *Amphitecna breedlovei* and is represented by two collections:

Municipio Ocozocoautla: Forest just above community and lake of Malpaso, 45 km. N of Ocozocoautla, 550 m. alt., steep ravines with “lower montane rain forest”, *Breedlove 32819* (CAS); 46 km. N of Ocozocoautla on road to Mal Paso, “lower montane rain forest”, 700 m., *Breedlove 38684* (CAS).

Amphitecna breedlovei differs very little in vegetative or floral characters from *A. donnell-smithii* (Sprague) L. Wms. with a similar but more eastern range in Izabal, Alta Verapaz, and extreme southern Petén Departments of Guatemala at altitudes from 50 to 350 m. (*Beaman 5206* (MO) from 450 m. in the Serrania de Los Tuxtlas, Veracruz State is probably also *A. donnell-smithii* indicating that it occurs in Tabasco and extreme northern Chiapas as well). The major difference between *A. donnell-smithii* and *A. breedlovei* is the former's much longer more cylindrical fruit — similar to *A. montana* L. Wms. (Figure 1B) but narrower, or to *A. silvicola* (Figure 1E) but tapering to an acute or subacuminate point. Most specimens of *A. donnell-smithii* have thinner more membranaceous leaves with distinct slender petioles sometimes to 1 cm. long. The leaves of *A. donnell-smithii* are always acuminate

(the tip usually 1–2 cm. long) and narrowly tapering to the base which differentiates them from typical *A. breedlovei* but not from the lower Grijalva valley form.

Amphitecna apiculata A. Gentry, sp. nov. Figure 1F

Arbor parva. Folia alterna, anguste obovata, acuta vel acuminata, subcoriacea vel chartacea, infra venis secundariis prominentibus. Inflorescentia pauciflora, floribus plerumque terminalibus; calyx leviter 2–3-labiatus; corolla albida, tubularis, lobis connatis, vix calycem excedens; ovarium ovoideum. Fructus indehiscens, apiculatus, cetero globosus vel ellipsoideus, laevis.

Small tree 4–13 m. tall; branchlets conspicuously angulate when young, subterete when older. Leaves simple, alternate, narrowly obovate, acute to acuminate at apex, more or less cuneate at base, (10–)15–35 cm. long, (3–)5–10 cm. wide, (some leaves of every collection at least 20 by 6 cm.), subcoriaceous to chartaceous, glabrous throughout except for a very few minute scattered lepidote scales, midrib raised slightly above and prominently below, secondary veins 10–15 on each side, prominulous above and prominent below, the main veins usually drying tannish against a grayish-olive surface, petiole essentially absent. Flowers mostly terminal, sometimes in part ramiflorous from bracteate short-shoots, borne singly or in fascicles of 2 or 3, the pedicels 3.5–5 cm. long; calyx campanulate, 16–20 mm. long, 9–10 mm. wide, glabrous, irregularly 2–3-labiately split in upper third or half; corolla white, more or less tubular, barely exceeding calyx, 2.2–2.8 cm. long, ca. 1 cm. wide at top of tube, the lobes more or less fused into an inconspicuous rim, lobes stalked-lepidote outside, tube glabrous outside, glabrous inside except a few stalked-lepidote glands near level of stamen insertion; stamens inserted ca. 10 mm. from base of tube, the filaments 1–1.3 cm. long, the thecae thick, hardly divergent, 3 mm. long; ovary ovoid, 2 mm. long, 1.5 mm. wide, densely lepidote; unilocular except at base with the ovules on two parietal placentae; disc ca. 1 mm. long and 3 mm. wide.

TYPE: **Mexico.** TABASCO: San Isidro, Balancan, 7–11 Jun 1939, *Matuda* 3388 (Holotype, MO 1172883; isotype, MO 1198258).

Occurring in the moist lowlands along the Rio Usumacinta in extreme northeastern Chiapas and adjacent Tabasco from 50(?)–350 m. altitude. A single fruiting collection from central Veracruz State also appears to be conspecific.

ADDITIONAL COLLECTIONS EXAMINED: **Mexico.** CHIAPAS: Municipio Palenque, 6–12 km. S of Palenque on road to Ocosingo, slopes and small streams with “tropical rain forest” along the ridges, 300 m., tree 40 ft., flowers white, *Breedlove* 28886 (CAS). Municipio Ocosingo, limestone ridges, tropical rain forest at the ruins of Yaxchilan, banks of Rio Usumacinta, 300 m., tree 40 ft. tall, *Breedlove* 33928 (CAS). Municipio Ocosingo, tropical rain forest along small streams near the settlement of Lacanja, 350 m., tree 40 ft. tall, *Breedlove* 34472 (CAS). VERACRUZ: Municipio Nautla, La Martinica, bosque de *Ficus*, terreno plano, 50 m., arbusto de 4 m. de alto, fruto verde, escaso, *Ventura* 3341 (F).

Amphitecna apiculata matches only *A. breedlovei* in having conspicuously apiculate fruits (Figure 1F). It differs from *A. breedlovei* in the larger (for the most part much larger) leaves, very different calyx and corolla, and lowland habitat. *Amphitecna apiculata* differs from lowland *A. donnell-smithii* in the apiculate fruit, much larger leaves, the much narrower corolla, and the calyx not split to near base.

Amphitecna steyermarkii (A. Gentry) A. Gentry, *Taxon* **25**: 108. 1976.

This species is remarkable in the genus in its spathaceously split calyx, a feature shared only with Panamanian *Amphitecna spathicalyx* (A. Gentry) A. Gentry. It was described from Guatemalan material lacking fruits. To the two collections previously known may be added a recent gathering from just across the Mexican border in Chiapas — *Breedlove* 39067 (CAS) from 1000 m. near Frontera Comalpa. Several additional collections are perhaps forms of *A. steyermarkii*. These include the following:

Mexico. CHIAPAS: Municipio Solosuchiapa, 2–4 km. below Ixhuatan along road to Pichucalco, 1200 m., *Breedlove* 34896 (CAS). Municipio Las Margaritas, confluence of Rio Ixcan with Rio Lacantum on Guatemala border, 300 m., *Breedlove* & *McClintock* 34091 (CAS). VERACRUZ: Municipio Santiago Tuxtla, summit of Cerro Vigia, 950 m., *Beaman* 6404 (MO).

None of the material cited above is at anthesis so it is impossible to verify whether the calyx is spathaceous or not. Vegetatively these large-leaved collections are closer to *Amphitecna steyermarkii* than to any other species; if not conspecific, they represent yet another undescribed taxon. Two of these specimens are of fruiting material and the fruit (Figure 1G) is most distinctive. The fruit is ellipsoid to narrowly ovoid, tapering to an acute but non-apiculate apex, strikingly rough-surfaced, 11–13 cm. long and 5–6 cm. in diameter. It is possible that the unusual surface texture is a result of abnormal growth but even in shape these fruits are unlike those

of any other species of northern Central America. Additional material of this complex is urgently needed.

Amphitecna montana L. Wms., Fieldiana, Bot. 36: 22. 1973.

This species was based on material from the Volcan Tajumulco region in extreme southwestern Guatemala (San Marcos Department) and adjacent Chiapas. Its lowest recorded altitude is 1900 m. It is well characterized by distinctly petiolate leaves, long pedicel, and circumscissile bilabiate calyx. The fruit (Figure 1B) is wider than in other *Amphitecna* species from northern Central America and borne on a longer pedicel.

Two rather fragmentary collections from outside this geographical area may tentatively be referred to *Amphitecna montana* on the basis of their long petiolate leaves. *Steyermark* 48766 (F) from 17 miles north of Barillas, Sierra de los Cuchumatanes, has more coriaceous leaves than any other collection of *A. montana* and comes from a lower altitude (1500 m.) than any of the Tajumulco area collections. The fruits, apparently not preserved, are described by the collector as 6 inches long and 3 inches in greatest diameter, dimensions that fit those for *A. montana*. A second problematical collection with long petiolate leaves comes from Montana de Celaque in Lempira Department, Honduras. The Honduran collection, *Hazlett* 2287 (MO), includes a single detached flower with a gigantic (3.5 by 3.1 cm.), apparently spathaceously split calyx, a short corolla only 3.5 cm. long, and conspicuously exerted anthers. Either or both of these may prove specifically distinct from *A. montana*.

Amphitecna silvicola L. Wms., Fieldiana, Bot. 36: 25. 1973.

This montane species was known only from the type collection from Chiapas when described; its fruit was unknown. Thanks to the recent effort of Dennis Breedlove and associates, *Amphitecna silvicola* is now known from four additional collections all from 1300–1400 m. near the type locality in the Municipio of La Trinitaria, Chiapas. Its fruit (Figure 1E) proves to be narrowly oblong-ellipsoid, obtuse to acute or short-acuminate, 14–15 cm. long, 4–5.5 cm. wide, the surface smooth and black-drying, the seeds ca. 1.3 cm. long and 1.5 cm. wide, embedded in the pulp. Several collections from 800–1200 m. altitude in Alta Verapaz, Guatemala, are probably also *A. silvicola* although not referred to this species in the *Flora of Guatemala*. These collections, which include only a single

fertile sheet with two flowers, have longer leaves than the Chiapas material and more prominulous secondary veins and less conspicuously white-edged venation beneath. They include *Standley 70325* (F, US) from the region of Cocola, northeast of Carcha, *Standley 70148* (F, US) from Saquija, 43 km. NE of Coban, and *Johnson 867* (US) from Quebradas Secas. Collections from the intermediate Cuchumatanes region are needed to resolve the taxonomic status of the Alta Verapaz plant.

Several more species of *Amphitecna* undoubtedly remain undescribed. *Matuda 17649* (F) from Corcega, Pueblo Nuevo, Chiapas, has a narrowly oblong almost square-based fruit quite unlike any of the known species. Several of the anomalous Veracruz collections discussed above may also prove specifically distinct when adequate material becomes available for analysis of patterns of variation.

NOTES ON BELIZE AND GUATEMALA SPECIES

1. ***Adenocalymma inundatum*** Mart. ex DC., Prodr. **9**: 201. 1845.
A. calderonii (Standl.) Seib. — See Gentry, 1976a.
2. ***Amphitecna latifolia*** (Mill.) A. Gentry, Taxon **25**: 108. 1976.
A. obovata (Benth.) L. Wms. — changes in the Code of Nomenclature adopted by the Leningrad Congress mandate choice of *Amphitecna* over *Dendrosicus* for this genus (Gentry, 1976b).

This combination needs additional justification in light of Williams' (1975) contention that Miller's *Crescentia latifolia* and all names for which it serves as basionym should be rejected as ambiguous. As I have previously noted (Gentry, 1973c), Miller (1768) treated two species of *Crescentia*, both of which are recognizable from their descriptions alone. His *C. latifolia, ex descriptione*, is the widespread species which until recently has been called *Enallagma latifolia* (Mill.) Small. In addition to a description Miller cited Plumier's (1703) *Cuiete latifolia, fructu putamine fragili* as a synonym, even deriving his specific epithet "latifolia" from Plumier. Plumier's (1703) generic illustration of *Cuiete* shows flowers, fruits and seeds all unmistakably belonging to this species. Later, in his *Plantarum Americanarum*, Plumier (1757) repeated the same illustrations of flowers, fruits and seeds adding to them a vegetative branch with the characteristic broad leaves of this species. Williams

(1975) argues that *Crescentia latifolia* and names based on it should be rejected as ambiguous until "typified by something which Miller saw." In the apparent absence of voucher material prepared from the plants cultivated by Miller, I have proposed the 1757 Plumier plate (*pl. 109*) as a type illustration, while Williams rejects this on the hypothesis that Miller (1768), who cites only the earlier Plumier reference, may not have seen the Plumier plate. Since the 1757 Plumier plate *duplicates* the 1703 rendition, except for addition of a vegetative branch, whether Miller actually saw both plates or only the cited one is largely irrelevant. I consider the latter, which was available long before 1768, a better type illustration because of its inclusion of the wide leaves on which Miller's specific epithet is based. The differences noted by Williams between the leaf dimensions of Miller's description and the Plumier plate are taxonomically unimportant, reflecting merely the juvenile condition of the living plants available to Miller. Twenty-three juvenile leaves of a plant grown by me from seed of a large-leaved tree matching Plumier's illustration averaged 4.4 inches (10.4 cm.) long and 1.3 inches (3.1 cm.) wide as compared with Miller's "three inches in length and one and a quarter broad in the middle" and the smallest juvenile leaves measured only 5 by 1.5 cm. While it is regrettable that no Miller collection is available to serve as a type, there is no ambiguity as to identification of either Plumier illustration or Miller's description itself; rejection of Miller's epithet is unjustified.

3. ***Arrabidaea costaricensis*** (Kränzl.) A. Gentry, *Brittonia* **25**: 231. 1973.

A. litoralis (HBK.) Standl. sensu *Flora of Guatemala*.

4. ***Arrabidaea podopogon*** (DC.) A. Gentry, comb. nov.

Spathodea podopogon DC., *Prodr.* **9**: 205. 1845. TYPE: Cuba, *Sagra 293* (G-DC).

Macfadyena podopogon (DC.) Griseb., *Cat. Pl. Cuba* 195. 1866.

Neomacfadya podopogon (DC.) Baill., *Hist. Pl.* **10**: 26. 1888.

Neomacfadyena podopogon (DC.) Baill. ex K. Schum. in Engl. & Prantl, *Nat. Pflanzenf.* **4**(3b): 227. 1894.

Phryganocydia brevicalyx Standl., *Field Mus. Bot.* **4**: 261. 1929. TYPE: Belize (British Honduras), Tower Hill, *Karling 39* (Holotype, F; isotype, US).

Monotypic *Neomacfadya* was described from Cuba but its center of distribution is the Yucatan Peninsula where it occurs in Belize, Guatemala (Peten) and adjacent Mexico (Quintana Roo and Yucatan). Although reported as "exceedingly rare" in the *Flora of*

Guatemala, it is abundant in secondary forest associations throughout Belize and is one of the commonest species of Bignoniaceae in the country. The outstanding feature of *Neomacfadya* is a (reputedly) spathaceous calyx, the definitive characteristic of the genus. Its spathaceous (actually subspathaceous to bilabiate) calyx has led to comparisons with *Macfadyena* (Grisebach, 1866) and *Phryganocydia* (Standley, 1929) but its much closer relationship with *Arrabidaea* has been overlooked. Every characteristic of *Neomacfadya* is shared with *Arrabidaea* (sensu Sandwith, 1968): simple tendrils, leaves simple in part, interpetiolar glandular fields, corolla pale magenta with white throat and puberulous outside, linear fruit, thin bialate seeds. Even *Neomacfadya's* thin subspathaceous to bilabiate calyx and few-flowered axillary inflorescences are not out of place in *Arrabidaea* (including *Scobinaria*, see Gentry, 1977). *Neomacfadya* is, in fact, intermediate between *Arrabidaea* (which it resembles in most characteristics) and *Scobinaria* which it resembles in calyx and inflorescence. Inclusion of *Scobinaria* in *Arrabidaea* mandates a similar reduction of *Neomacfadya* with the single new combination proposed above.

5. ***Arrabidaea pubescens* (L.) A. Gentry, Brittonia 25: 239. 1973.**

A. sieberi DC. — I recently found the missing Houston type material of *Bignonia pubescens* L. (based on Miller's (1759) *Bignonia bifolia frutescens, foliis subtus villosis, siliquis longissimus compressis*) filed with undetermined South American Bignoniaceae in the British Museum herbarium. The type represents the plant formerly known as *A. sieberi* as I had surmised from the description (Gentry, 1973a) and proves the identity of that species with *A. pubescens*.

6. ***Arrabidaea verrucosa* (Standl.) A. Gentry, Selbyana 2: 43. 1977.**

Scobinaria japurensis (DC.) Sandw. sensu Flora of Guatemala.

7. ***Ceratophytum tetragonolobum* (Jacq.) Sprague & Sandw.**

C. tobagense (Urb.) Sprague & Sandw.

8. ***Cydista aequinoctialis* var. *hirtella* (Benth.) A. Gentry, Brittonia 25: 231. 1973.**

C. sarmentosa (Bertol.) Miers.

9. ***Distictis buccinatoria* (DC.) A. Gentry, Brittonia 25: 237. 1973.**

Pithecoctenium buccinatorium DC.

10. ***Jacaranda copaia* ssp. *spectabilis*** (Mart. ex DC.) A. Gentry, comb. et stat, nov.

J. spectabilis Mart. ex DC., Prodr. 9: 229. 1845. TYPE: Brazil, Amazonas, *Martius* s.n. of 1819 (M).

J. copaia var. *spectabilis* (Mart. ex DC.) Bur. ex Bur. & K. Schum. in Mart., Fl. Bras. 8(2): 287. 1897.

J. superba Pittier, Bol. Soc. Venez. Ci. Nat. 6: 19. 1940. TYPE: Venezuela, Bolivar, *Williams 11537* (F. US).

The common widespread *Jacaranda* of Central America, north-west South America and Amazonia differs significantly from the related plant of lowland Guayana in a number of morphological characteristics. Vegetatively it has more numerous pinnae and leaflets per pinna and smaller acute (not obtuse) membranaceous to chartaceous (not subcoriaceous) rhombic-elliptic (not elliptic to oblong-elliptic), sessile or subsessile (not distinctly petiolulate) leaflets. The widespread *Jacaranda* has thinly woody capsule valves 3.3–6 cm. wide while the Guayana area plant has thick woody capsule valves 7–10 cm. wide. I can detect no floral differences. The type of *J. copaia* (*Aublet* s.n. (P-AD 12304)) comes from the Guayana population; the widespread form has been described as *J. spectabilis* and as *J. superba*.

These two plants have generally been treated as constituting a single species following Bureau & K. Schumann's (1896–97) *Flora Brasiliensis* treatment. The acute-leafleted widespread form was reduced to varietal status by Bureau & K. Schumann on the basis of five mostly fragmentary collections — three of the Guayana plant and two (one from Panama and one from Amazonian Brazil) of the widespread form. The patterns of variation between the two populations were hardly evident from the scanty herbarium material then available, and distinction at the varietal level seemed appropriate.

The abundant additional material now available shows not only that the differences between these two entities are constant but also that they have mutually exclusive ranges (Figure 2). At least in Venezuela the range difference is ecologically correlated. The plant with round-tipped oblong-elliptic leaflets occurs only in the swampy lowland forest of Delta Amacuro (and adjacent extreme eastern Monagas State) while the form with acute rhombic leaflets occurs in well drained tropical moist forest through most of western and



Figure 2. Distribution of *Jacaranda copaia* (Aubl.) D. Don ssp. *copaia* (stars) and *J. copaia* ssp. *spectabilis* (Mart. ex DC.) A. Gentry (circles).

southern Venezuela including parts of Bolivar and Monagas States immediately adjacent to the Delta Amacuro swamp forest.

Taxonomically, these differences warrant more than varietal recognition and are certainly greater than those between several currently recognized *Jacaranda* species. Nevertheless the two forms of *J. copaia* are very closely related and relatively isolated from other species of the genus. In consideration of the wide use of the epithet *copaia* throughout the ample range of the acute-leafleted entity, I opt for its subspecific recognition as *J. copaia* ssp. *spectabilis*.

11. ***Lundia puberula*** Pittier, Contr. U. S. Natl. Herb. **18**: 258. 15 Sept. 1917.

L. diceilocalyx Blake, Contr. Gray Herb. **52**: 94. 28 Sept. 1917.

12. **Mansoa verrucifera** (Schlecht.) A. Gentry, *Ann. Missouri Bot. Gard.* **63**: 62. 1976.
Adenocalymma fissum Loes.
13. **Pachyptera hymenaea** (DC.) A. Gentry, *Brittonia* **25**: 236. 1973.
Pseudocalymma sagotii (Bur. & K. Schum.) Sandw. sensu *Flora of Guatemala*.
14. **Pachyptera standleyi** (Steyerm.) A. Gentry, *Brittonia* **25**: 236. 1973.
Pseudocalymma sagotii var. *macrocalyx* (Sandw.) L. Wms.
15. **Pithecoctenium crucigerum** (L.) A. Gentry, *Taxon* **24**: 123. 1975.
P. echinatum (Jacq.) "K. Schum."
16. **Pseudocatalpa caudiculata** (Standl.) A. Gentry, *Brittonia* **25**: 241. 1973.
Mussatia caudiculata (Standl.) Seib.
17. **Stizophyllum riparium** (HBK.) Sandw., *Lilloa* **3**: 462. 1938.
S. perforatum (Cham.) Miers sensu *Flora of Guatemala*.
18. **Tabebuia donnell-smithii** Rose, *Bot. Gaz.* **17**: 418, 5. 26. 1892.
Roseodendron donnell-smithii (Rose) Miranda — see Gentry 1976a.
19. **Tabebuia impetiginosa** (Mart. ex DC.) Standl., *Publ. Field Mus. Nat. Hist., Bot. Ser.* **11**: 176. 1936.
T. palmeri Rose.

Two other species pairs are best treated as synonymous: *Amphitecna oblanceolata* L. Wms. with *A. donnell-smithii* (Sprague) L. Wms. and *Macfadyena mollis* (Sond.) Seem. (as used in Central America) with *M. uncata* (Andr.) Sprague & Sandw.

Four additional species which were not included in the *Flora* are now known from Guatemala — *Pleonotoma variabilis* (Jacq.) Miers (*Steyermark 39504*, Izabal Province, south-facing lower ridges of Cerro San Gil, opposite Cayuga, 30–500 m.) characterized by biternate leaves, square branchlets, and trifid tendrils and three of the *Amphitecna* species discussed above — *A. steyermarkii* (A. Gentry) A. Gentry, *A. silvicola* L. Wms., and *A. costata* A. Gentry.

REFERENCES CITED

- BREEDLOVE, D. E. 1973. The phytogeography and vegetation of Chiapas (Mexico). Pp. 149-165 *in*: A. Graham, ed., *Vegetation and vegetational history of northern Latin America*. Elsevier, Amsterdam.
- BUREAU, E. & K. SCHUMANN. 1896-97. Bignoniaceae. *In*: Martius, *Flora Brasiliensis* 8(2).
- GENTRY, A. H. 1973a. Generic delimitations of Central American Bignoniaceae. *Brittonia* 25: 226-242.
- . 1973b (1974). Bignoniaceae *in* Flora of Panama. *Ann. Missouri Bot. Gard.* 60: 781-977.
- . 1973c. Studies in Bignoniaceae VII, *Dendrosicus*, *Enallagma*, and *Amphitecna*. *Taxon* 22: 637-640.
- . 1974. Coevolutionary patterns in Central American Bignoniaceae. *Ann. Missouri Bot. Gard.* 61: 728-759.
- . 1976a. Studies in Bignoniaceae 19: Generic mergers and new species of South American Bignoniaceae. *Ann. Missouri Bot. Gard.* 63: 46-80.
- . 1976b. *Amphitecna*, *Enallagma*, and *Dendrosicus* revisited. *Taxon* 25: 108.
- . 1976c. Bignoniaceae of southern Central America: distribution and ecological specificity. *Biotropica* 8: 117-131.
- . 1977. New species of Leguminosae, Lauraceae, and Monimiaceae and new combinations in Bignoniaceae from western Ecuador. *Selbyana* 2(1): 39-45. 1977
- GRIGGS, R. F. 1904. A vegetable mimic. *Plant world* 7: 196-198.
- GRISEBACH, A. H. R. 1866. *Catalogus Plantarum Cubensium*. Leipzig.
- MILLER, P. 1759. *The Gardeners dictionary*. Ed. 7. London.
- . 1768. *The Gardeners dictionary*. Ed. 8. London.
- PLUMIER, C. 1703. *Nova Plantarum Americanarum Genera* 23, *pl.* 16. Paris.
- . 1757. *Plantarum Americanarum* 5: 100, *pl.* 109. Amsterdam/Leiden.
- SANDWICH, N. Y. 1939. Bignoniaceae. *In*: Notes on a collection of plants from British Guiana. *Lloydia* 2: 209-213.
- . 1968. Notes on Bignoniaceae 29: Arrabidaea *in* Martius's "Flora Brasiliensis" and subsequently. *Kew Bull.* 22: 403-420.
- SPELLMAN, D. L., W. D. DWYER & G. DAVIDSE. 1975. A list of the monocotyledoneae of Belize, including a historical introduction to plant collecting in Belize. *Rhodora* 77: 105-140.
- STANDLEY, P. C. 1929. Studies of American plants — I. *Field Mus. Nat. Hist., Bot. Ser.* 4: 197-299.
- & L. WILLIAMS. 1974. Bignoniaceae. *In*: Flora of Guatemala. *Fieldiana, Bot.* 24: 10(3).
- WILLIAMS, L. O. 1975. *Amphitecna* and *Dendrosicus* revisited. *Taxon* 24: 694-695.

ALWYN H. GENTRY

MISSOURI BOTANICAL GARDEN

ST. LOUIS, MISSOURI 63110